SUCCESS STORY

CQFA CARREFOUR QUÉBÉCOIS DE LA FABRICATION ADDITIVE

POLYCSAM: A HUB FOR INDUSTRY AND RESEARCH

PolyCSAM is a world-class industrial development and demonstration platform for hybrid cold spray additive manufacturing. Cold spray additive manufacturing, or CSAM, is a material deposition process used to create a wide variety of structures ranging from functional coatings to 3D structures. It features several technological advantages, including deposition rates that are 10 to 1,000 times higher than those of competing technologies, along with very little heat transfer to the substrate. It therefore provides a significant competitive advantage for many industrial applications, including aerospace, ground transportation and energy.

The SmartCSAMTM platform incorporates the most innovative techniques for surface preparation, material deposition, heat treatment and robotic surface machining and finishing. It also features a robust process control approach based on Big Data/machine-learning analysis. Designed and operated based on Industry 4.0 principles, PolyCSAM offers to its clients a fully digitized industrial environment that can manufacture and repair parts or assemblies with dimensions ranging from a few centimetres to several metres, and weights varying from a few kilograms to several hundreds of kilograms (www.polycsam.ca). CSAM is also known to be and entirely green processe, as no hazardous gases nor liquids are used, and 100% of the energy comes from hydroelectricity. Moreover, powders that do not adhere to parts are recovered in an eco-responsible manner. In short, PolyCSAM is proudly committed to sustainable development and the circular materials economy.

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PolyCSAM would never have emerged without the CSAM Industrial R&D Group (2015-2020), launched and led by the National Research Council of Canada (NRC). The CSAM Group brought together some 20 companies around a single roadmap to identify the ideal characteristics of various base materials and their associated process parameters while staging generic application demonstrations that sought to make additive manufacturing cost-effective through cold spray technology. Through its active participation in the CSAM Industrial R&D Group, Polycontrols successfully established a business case promoting further developments & investments in the field.

Then came the signing of a long-term, seven-year collaborative agreement between Polycontrols and the NRC in March 2019.

In the end, both milestones helped Polycontrols justify its $4 million investment in PolyCSAM before launching its operations in April 2020.

AMPLIFYING COLLABORATION

The PolyCSAM project was a considerable driving force for synergy, enshrining research-industry collaboration via long-term agreement. This agreement has already given rise to more than a dozen joint projects between the NRC and Polycontrols for application development. Thus, the CSAM Industrial R&D Group and PolyCSAM allowed this extremely promising ecosystem to flourish.

While this type of research-industry collaboration poses a number of challenges, the framework agreement signed between Polycontrols and the NRC – the first of its kind in Canada – is unique in that it provides the agility & flexibility to get promising projects off the ground quickly. For Polycontrols, this represents an essential condition due to its primarily industrial client base.

"Regardless of differences involving the size, structure and culture of both organizations, collaboration is possible and remains entirely based on individuals; they are the ones who ultimately make a difference by promoting synergy and collegiality."

– Luc Pouliot,
Co-owner at Polycontrols